REMARKS

Claims 76-116, 118-127 and 135 presently appear in this case. Claims 76-107 have been withdrawn from consideration. No claims have been allowed. The Official Action of May 26, 2010, has now been carefully studied. Reconsideration and allowance are respectfully urged.

The present invention is based on the finding that sphingoid polyalkylamine conjugates, such as N-palmitoyl D-erythro sphingosyl carbamoyl-spermine (CCS), provide enhancement of the extent and nature of the immune response to an antigen. As such, the sphingoid polyalkylamine conjugates act as adjuvants. Thus, the claims are directed to a vaccine comprising sphingoid-polyalkylamine conjugate and an immune response modulating biologically active molecule. The amount of biologically active molecule is effective to modulate the immune response of a subject and the amount of sphingoid polyalkylamine conjugate is effective to enhance the activity of the biologically active molecule on the immune response of the subject. In claim 108, the biologically active molecule must be an antigenic protein, an antigenic peptide, an antigenic polypeptide or a carbohydrate. In claim 135, it is an oligodeoxynucleotide (ODN).

As explained in detail in applicant's previous response, the sphingoid polyalkylamine conjugates in accordance with the invention are not only acting as a simple carrier for biologically active molecules, as contended by the examiner, but in fact are also surprisingly acting as an adjuvant.

Claims 108-114 have been rejected under 35 USC 103(a) as being unpatentable over Jorgensen. The examiner states that Jorgensen teaches a composition comprising a lipid-polyalkylamine conjugate, and particularly the claimed sphingoid-polyalkylamine conjugate. The examiner recognizes, however, that Jorgensen does not include a biologically active molecule with the composition. However, the examiner states that the compound of Jorgensen can be used to facilitate delivery of therapeutic agents such as DNA, mRNA, antisense oligonucleotides, proteins and drugs into cells - all of which are allegedly biologically active molecules that modulate and induce an immune response, citing page 1 of Jorgensen. The examiner states that one of ordinary skill in the art, at the time the invention was made, would have been motivated to combine them to facilitate delivery of molecules, and that one of ordinary skill in the art would have had a reasonable expectation of success for doing so because Jorgensen discloses that lipid-

polyalkylamine conjugates are effective to facilitate delivery of drugs into cells. The examiner considers the recitation "vaccine" in the preamble of claim 108 as being merely a statement of intended use, without limiting the claim. Further, the examiner relies on paragraphs [0003] and [0014] of Jorgensen as teaching a vaccine. The examiner also relies on paragraphs [0014] and [0033] of Jorgensen as teaching delivery of drugs and genes for therapeutic functions. This rejection is respectfully traversed.

It would not be obvious to use the lipid-polyalkylamine conjugates of Jorgensen to deliver antigenic proteins, antigenic peptides, antigenic polypeptides or carbohydrates, as recited in claim 108 and all claims dependent therefrom, or to deliver ODN, as recited in claim 135. Despite reference to delivery of "drugs," one of ordinary skill in the art reading the Jorgensen publication as a whole, would only find it obvious to use the conjugates of Jorgensen for the purpose of gene delivery.

Paragraph [0002] of Jorgensen states:

> One aspect of gene therapy involves the introduction of foreign nucleic acid (such as DNA) into cells, so that its expressed protein may carry out a desired therapeutic function. [emphasis added]

The following paragraph begins, "Examples of this type of therapy include … ." These examples include the

introduction of proteins such as HIV antigens and antigens to act as vaccines. However, it would be understood from the previous paragraph and the beginning of paragraph [0004] that, when proteins are referred to, those proteins are the expression product of a gene because the invention relates to gene therapy. Thus, the reference to the insertion of antigens would be understood by those of ordinary skill in the art as being the insertion of genes that express such antigens, as gene therapy would not include introduction of the protein antigens directly. Claim 108 does not comprehend delivery of any nucleic acid product. Claim 135 only relates to the delivery of ODN. As an ODN is not a gene or nucleotide sequence that is intended to express anything, it would not be obvious to use ODN as the nucleotide being delivered in a gene therapy patent, such as Jorgensen.

Furthermore, lipid (8) in Figure 1 of Jorgensen is the disclosed compound that is most similar to the presently claimed compounds, if ceramide is substituted for cholesterol. However, lipid (8) is only used in Jorgensen as an intermediate and thus it would not be obvious to use such an intermediate as a therapeutic.

For all of these reasons, reconsideration and withdrawal of this rejection are respectfully urged.

Claims 108-116 and 118-127 have been rejected under 35 USC 103(a) as being unpatentable over Miller in view of Jorgensen. The examiner states that Miller teaches a composition comprising cholesterol carbamoyl spermine and its analogs. The examiner considers it obvious from Jorgensen to use ceramide as the lipid in the lipid-polyalkylamine conjugate of Miller and to use it to facilitate delivery of therapeutic agents into cells. This rejection is respectfully traversed.

Miller relates only to gene therapy. Accordingly, Miller adds nothing to the deficiencies of Jorgensen as discussed with respect to claims 108, 110 and 135. The combination of Jorgensen with Miller still does not establish the obviousness of use of the sphingoid-polyalkylamine conjugate with a biologically active molecule (that is not a gene) capable of modulating the immune system of a subject, or the unexpected adjuvant effect of the compound on that immunomodulation. Accordingly, reconsideration and withdrawal of this rejection for the same reasons as discussed above with respect to the rejection over Jorgensen alone, are respectfully urged.

It is submitted that all of the claims now present in the case clearly define over the references of record and

are in full compliance with 35 USC 112. Accordingly, reconsideration and allowance are earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicants

By /rlb/
Roger L. Browdy
Registration No. 25,618

RLB:jhw
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
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